USAWC MILITARY STUDIES PROGRAM PAPER

COMPUTER SIMULATIONS AND THE ARMY WAR COLLEGE, WHERE ARE THE GAMES?

An Individual Study Project
Intended for Publication

by

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The Army is undertaking a major change in its training program through the increased use and reliance upon computer simulations. This technical revolution requires a change in organizational thinking (behavior) for the Army. A critical factor to the success of this new tool is the appropriate education of the leaders who will drive the implementation and sustainment of this change throughout the Army. The current curriculum at the Army War College does not provide the requisite education nor does it encourage the

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The Army is undertaking a major change in its training program through the increased use and reliance upon computer simulations. This technical revolution requires a change in organizational thinking (behavior) for the Army. A critical factor to the success of this new tool is the appropriate education of the leaders who will drive the implementation and sustainment of this change throughout the Army. The current curriculum at the Army War College does not provide the requisite education nor does it encourage the student to be an advocate of computer simulation use. The purpose of this paper is to discuss the perceived shortfall in the education of officers at the United States Army War College. This paper outlines the importance of computer simulation usage, its relevance as an educational tool, how computer simulations are currently incorporated into the United States Army War College curriculum, and why more use must be integrated.

Today the Army is facing a major dilemma -- how to maintain a well trained deterrent force in the face of reduced funding levels and restrictions on maneuver. This dilemma is caused by a changing world situation marked by internal and external political changes as well as differing internal views concerning priorities. No matter what the difficulties are, we still must provide for a credible deterrent combat force. To accomplish this, the Army is on the threshold of a new training strategy which includes enhancements to the way we have trained in the past. This strategy incorporates technological advancements in computers and computer simulations. From their use, we can continue high quality of training at all levels while saving money, the land, and our equipment. This evolution in training methodology does, however, require a major change in the training mindset of Army leadership. One would think that the Army would use every opportunity to teach the new skills and encourage its senior officers to herald the increased possibilities. These Army War College students today will be the leaders of tomorrow who will constitute the driving force behind the acceptance and proliferation of simulations as a training method. The future leaders must be educated to a higher level of computer competency so that the training change can be made. Only then will this change be sustained. The Army is not, however, taking advantage of senior officer education at the

Army War College to facilitate the Army-wide implementation of computer si- -ions.

Thus, the purpose of this paper is to discuss that perceived shortfall in the current education of officers at the Army War College. This shortfall is of particular importance, not just to officer professional development, but also to the success or failure of the change to increased use of computer simulations in Army training. In this paper, I will discuss why simulations are an excellent tool and critique the current use of computer simulations in the curriculum. I will not address how to inplement increased useage of computer simulations in the curriculum except by saying that we could be doing more now, and they can and, in fact, must be integrated at a much faster rate than currently programmed.

The initial question that arises is, why simulations? Warfare at any level is a complex affair. It is imperative that we do everything possible in training to prepare for the event of war. Without experiencing a real war, we must put the maximum degree of combat realism into all of our peacetime training. A computer simulation imitates real warfare to varying degrees by quickly processing information in a representation of real events.[1] Computer simulations offer many advantages as a training tool. Time may be speeded up or slowed down. There is a sense of immediacy to learning tasks. Simulations may be more realistic than classroom instruction and some field exercises and may enable students to deal with more complex

systems. Finally, simulations teach students to deal with a real life situation in a learning experience.[2] These points describe computer simulation applicability to the complexities of actual warfare. The better we design all of our training to replicate the fog and confusion of actual war, the better chance we give our soldiers to fight successfully for our national purpose. Computer simulations provide an excellent design tool in that training.

To begin, let us examine my contention that the Army War College does not educate its students on the use of computer simulations. An investigation of the current curriculum -- to include the four core courses, the elective courses, and suggested military studies program (MSP) subjects -- offers evidence. There are only two uses of computer simulations in all four of the core courses. Core Courses 1 and 2 have no computer simulations included in them. During Core Course 3, the students are involved in Exercise Alleghany, which provides only a limited example of the scope of a computer simulation. This exercise includes the use of the Rapid Deployment Exercise (RADEX) Model. Several students from each seminar are required to learn in a one-hour class how to operate the menu-driven input for this model. These students input the selected troop deployment courses of action to test deployment options for a Southwest Asia contingency operation. RADEX is a simplistic troop deployment model which only considers ports, lift capacity and timing. It does not offer insight into any other facet of the planned operation. From my

personnel involvement, the computer simulation portion of this exercise is a distractor from the intent of the exercise as currently designed, and is certainly not an example of the scope and realism capabilities of computer simulations.

Core Course 4, the last of the core courses, brings together all of the subjects taught during the academic year. This course provides the framework to apply what has previously been learned.

> It represents an opportunity for students to develop national and theater level strategies with global and regional applications - the ends, ways, and means of the military instrument of power - and then apply those strategies in simulated situations via role playing. Students will consider, make, and execute decisions pertinent to a broad cross section of security issues at the national and theater levels of operation.[3]

What an outstanding opportunity to use computer simulation to enhance this culminating learning experience. However, this is not the case. Only a simplistic force structure model, similar to the RADEX Model in fidelity and sophistication, is incorporated into the course. Once again an opportunity to integrate computer simulations into the curriculum is missed.

With the importance of computer simulation rising in the Army, it would seem that more attention would at least be given the subject during Army War College elective courses. The contrary is true. Of the 94 offered elective courses, to include the Advanced Warfighters Studies Program (AWSP), only four electives include computer simulation or computers in their subject matter.[4] One deals entirely

with information management and not computer simulation. A second covers the wargame models available to all Unified and Specified Commander's in Chief (CINC). The final two have active involvement in a computer simulation used to explore the feasibility of a student devised operational course of action: Joint Land, Aeorospace, and Sea Simulation (JLASS) and the Asia Exercise during AWSP. The bottom line is that only four percent of the elective courses involve computers at all, with only two percent requiring an active use of a computer simulation to evaluate a student-derived course of action. In sum, my examination of the current use (actually lack thereof) of computer simulations in the Army War College core and elective courses does not appear to provide a MEANS to educate the Army War College students on the use and importance of computer simulations let alone gain their future support of the Army END of increasing computer simulation use in training.

The suggested list of choices offered by the Army War College for individual MSP topics reveals an even bleaker picture. There are 394 MSP topics issued to the students in the course reference material book as appropriate for consideration for study.[5] Of this number, only 12 are directly or indirectly related to computer simulation. That is is three percent of the total suggested topics -- these, suggested ostensibly because they have importance to some headquarters, staff, or the Army in general! Of these 12 topic areas, only one was selected for individual student study.[6] The selected

topic was "Utility of the Ada Computer Language for Army Combat Modeling." This topic does not evaluate computer simulations per se or simulation use in the military. This dearth demonstrates the absence of student interest in the topic, and perhaps reflects their lack of background, familiarity, and comfort with the subject of computer simulations. It definitely does not reflect the type of attitude the future leaders of the Army must have, if the Army incorporates computer simulations as part of its routine training program.

Where do we go from here? The use of resource-saving computer simulations is part of the Army's new training direction now and will be increasingly so for the future. The decision has been made. Now the challenge facing the Army is how to implement this strategy throughout the force and sustain its growth. The basic premise here is that in order for the aforementioned to occur, the mindset for training must be changed to ensure this mandated growth and sustainment. In the past, sound visionary ideas have failed in the long run due to a lack of a long-term-change strategy to cause their incorporation into the Army. The top leadership of the Army must not assume nor be deluded into thinking that this change will come about just because they have decided upon it.[7] To affect this change, a broad constituency must be solicited and must readily join in the process that will bring about the change.[8] Success with the change apparatus is dependent both on the commitment and support from all

levels of leadership as well as commitment from all levels of the organization.[9] The student officers at the Army War College, as a portion of the senior officer leadership of the Army, are being left out of the change. It is difficult to imagine a major change affecting the entire Army, such as the increased use of computer simulations in training, coming to fruition and being sustained without the wholehearted support of this group of officers.

The basic structure and philosophy of training execution clearly stated in United States Army Field Manuals 25-100 and 25-101 provide a sound foundation for Army training. With shrinking levels of funding available and the continuing demand to prepare our forces for their multitude of contingencies, computer simulations can provide realistic training that fulfills these needs within the known constraints. Although aware of the need for and capability of computer simulations in training to enhance the more expensive and resource intensive methods, the Army is not using these to the extent possible. Worse, the Army is not developing a change in leadership behavior that is compatible with their use, nor creatively thinking of new and more extensive ways to use them. The implementation of this technological evolution in training methodology requires a change in the thinking of Army leadership which requires a change in the organizational thinking of the Army.

Based on the hypothesis that the increased use of computer simulations in Army training requires a change in the organization,

what is the best course to follow to implement this change? The study of organizational behavior offers a myriad of theories relating to successful change in an organization. Several of these theories have direct applicability upon the process of changing present Army training methodology. A combination of these theories will lead to the best formula for change. There are fundamentals required, expressed in several theories, that should guide the Army through successful implementation. Acceptance of the basic premise that the use of computer simulations is a relevant strategy to enhance Army training is the starting point. The basic question is, how do we implement and then sustain this strategy throughout the Army? The easy answer that, "We have the capability; therefore, we will use it," misses the mark. Historically we have had many innovations in training that have not been implemented to the degree envisioned by the innovators. Some good ideas that did not reach designed use include the Bessler Que-C, several manual wargame simulations, and even to some extent the MILES systems. I believe these occurred in part because a conscious decision to change was made but the organization was not forced to implement these tools. A change in an organization must be guided by a change in the organizational climate -- the way we are caused to think and operate.[10] A critical step is to decide upon an influence strategy to get support for the desired change.[11] This basic step emphasizes the importance of obtaining participation throughout the organization during all phases

of the change process.[12] This portion of the process involves the organization learning to change.

There are several ingredients in this subprocess. First is providing education as an integral part of the implementation. Second is to use good training to protect the new process. In part, this is done by relating training to the needs of the end user and ensuring the relevance of the educational process. Another is to use a variety of educational techniques. Last is to create a self-improvement environment for end users, and to offer a thorough education about the change.[13] Clearly, the Army is not meeting these needs by its failing to use the Army War College education as a tool in implementing this organizational change.

Another way to look at organizational change may also apply. To achieve a change in any organization, it is necessary to overcome human and organizational barriers.[14] Force Field Analysis is a theory that has proven especially helpful to action-oriented leaders. This theory is based upon the assertion that change is a function of a dynamic interacton of forces working in opposite directions. On one side there is resistence to change, the maintenance of the status quo. It is opposed by pressures to change, pushing for a new direction. Balancing these forces in a state of equilibrium is the goal of the organization.[15] This theory offers three major courses of action to use in changing. First, increase the pressures for change. Second, reduce or remove the reasons for resistence to change. Third, change

the direction of a force, change a resistence to change into a pressure for change. The overall process within the organization is composed of Unfreezing, Moving, and Refreezing these forces.[16]

Analysis in these terms shows a critical breakdown in the Army War College curriculum. Unfreezing involves reducing the forces maintaining current behavior by introducing information that shows discrepancies between current and desired behavior. In this case, the change to increased computer simulation use has been dictated as a method to maximize training opportunities. Moving shifts behavior by developing new attitudes through changes in processes. This is the portion of the process in which we are not adequately using the Army War College education. Refreezing stabilizes the new status of equilibrium, the desired result of the change process. This can be accomplished by the graduating officers who have first hand experience with and are spokesmen for the increased use of computer simulations in training.

A key to success in implementing change is to involve all levels of leadership in all aspects of the implementation.[17] Leadership is the key ingredient because leaders in turn will ensure that the change occurs and is sustained. They must understand the system and process, have early experience with it, and be enthusiastic supporters of it.[18] Success at this endeavor is achieved by this leadership's involvement and the appropriate application of the principles of adult

education.[19] It must be kept in mind that the change will come through the efforts of the leaders and subordinates and be facilitated, not caused, by education.[20]

The keys to affecting this change lie in the education of the leadership and understanding the principles of adult education. Basically, adults do not learn for the same reasons as children and therefore should not be taught the same way. Several studies, including those by Houle, Tough, and Burgess, investigated why adults learn.[21] Results were similar for all three studies: Adults learn primarily to obtain a specific rather than a general objective and, moreover, exhibit a desire to learn for immediate, practical use. Adults also learn best when learning requires an action on their part that has some sort of immediate feeback.

The theory of adult education translates these reasons for a desire to learn into a theory for harnessing this desire into a constructive learning experience.[22] The theory is based on four tenets about learning. The learning must have the perception of being self-directed or resentment and resistence to learning are blocks. Learning needs to rely on the rich resource of the student's experience to make him part of the learning. The adult student readily learns what is relevant and can be used in their jobs. And finally, learning is oriented on that which is problem centered, immediate, and can be readily applied.

The application of adult education occurs through a process model, one currently in place at the Army War College. With effort, this model can be used for the integration of computer simulations into the curriculum and the Army. The process includes several elements. One is to establish a climate conducive to learning. Second is to create mechanisms for mutual planning. Third is to diagnose needs for learning. Following that is to formulate objectives that will meet needs, to design a pattern of learning experiences, and to conduct learning experiences with suitable material and techniques. Last is to evaluate learning outcomes and rediagnose needs.

It has been postulated that training programs which are not integrated into an overall organizational improvement will have little, if any, positive effect on the organization.[23] This precept has applicability to the method the Army is using to incorporate computer simulation into unit training. Experts have been trained to operate the hardware and software, but the overall organizational commitment has not been assured. One gets this approval by gaining the support of leadership at all levels.[24] Training should facilitate organizational change, not provide the change.[25]

What then is the prognosis for the use of computer simulations in the Army and at the Army War College? For the Army, the answer is straightforward. Computer simulations fill what could be a debilitating void in our ability to conduct large-scale unit training. This use of the forward edge of technology will maintain the Army's

combat readiness to meet its wide range of contingencies. Therefore, it is a method we can currently use to maximize our scarce or otherwise limited resources to effectively train the force. But the senior leadership must continually foster their growth in usage for training.

The Army War College presents another situation but one fact is absolutely critical to ensuring this goal is achieved. The implementation of the use of computer simulations in the curriculum is far behind the need for the useage in the rest of the Army. What will it require to get usage back on track? First, must be a strong commitment and direction from the commandant. This is currently an item of interest and emphasis for him. Second, must come a great deal of work, innovation, creativity, and support from the faculty, who will have the yeoman task in implementing the increased usage in the courses. Intradepartmental consensus on the use is an essential to overcome the inertia that could keep change out of the curriculum. The Center for Strategic Wargaming (CSW) is prepared to offer both technical advice and support, but can only respond to a consensus for action which incorporates computer simulation progressively into the curriculum. Growth process in the curriculum will also depend upon sufficient resourcing of computer hardware needs. Together these things will further the graduates' realization of the great enhancement computer simulation offers to training and achieve the essential end: An Army that maximizes the use of technology in training to maintain its combat readiness.

ENDNOTES

1. Dwight W. Allen and Don D. Bushnell, The Computer in American Education, New York, John Wiley and Sons, Inc., 1967, p. 60.

2. Ibid., p. 61.

3. Course 4 Directive, Academic Year 1990, Carlisle Barracks, United States Army War College, 1990, p. 1.

4. Advance Courses Program, Academic Year 1990, Carlisle Barracks, United States Army War College, 1989, pp. C1-C47.

5. Reference Material, Academic Year 1990, Carlisle Barracks, United States Army War College, 1989, TAB F.

6. Military studies Program Project/Student Cross Reference Report (By Student), Carlisle Barracks, United States Army War College, 4 December 1989.

7. Murray M. Dalziel and Stephen C. Schoonover, Changing Ways, New York, American Management Association, 1988, p. 5.

8. Ibid., p. 62.

9. Emily E. Schultheiss, Optimizing the Organization, Cambridge, Massachusetts, Ballinger Publishing Company, 1988, p. 36.

10. W. Warner Burke, "The Role of Training in Organizational Development," Training and Development Journal, Vol. 26, No. 9, September 1972, p. 32.

11. Dalziel and Schoonover, p. 36.

12. Burke, p. 32.

13. Dalziel and Schoonover, pp. 118-122.

14. Ibid., p. 27.

15. Don Hellriegel, John W. Slocum, and Richard W. Woodman, Organzational Behavior, St. Paul, Minnesota, West Publishing Company, 1986, p. 590.

16. Ibid., p. 591.

17. Schultheiss, p. 38.

18. Ibid., pp. 43-44.

19. Malcolm Knowles and Associates, Andragogy in Action, San Francisco, Jossey-Bass Publishers, 1984, p. 36.

20. Burke, p. 33.

21. Patricia K. Cross, Adults as Learners, San Francisco, Jossey-Bass Publishers, 1987, pp. 82-91.

22. Malcolm Knowles, The Adult Learner: A Neglected Species, Houston, Gulf Publishing Company, 1978, pp. 55-59.

23. Burke, p. 30.

24. Ibid.

25. Ibid., p. 33.

BIBLIOGRAPHY

1. Advance Courses Program Directive, Academic Year 1990. Carlisle Barracks: United States Army War College, 1989.

2. Allen, Dwight W. and Don D. Bushnell. The Computer in American Education. New York: John Wiley and Sons, Inc., 1967.

3. Burke, W. Warner. "The Role of Training in Organizational Development." Training and Development Journal, Vol. 26, No. 9, September 1972, pp. 30-34.

4. Course 4 Directive, Academic Year 1990. Carlisle Barracks: United States Army War College, 1990.

5. Cross, Patricia K. Adults as Learners. San Francisco: Jossey-Bass Publishers, 1987.

6. Dalziel, Murray M. and Stephen C. Schoonover. Changing Ways. New York: American Management Association, 1988.

7. Goff, Robert J. and Fred John Pula. Technology in Education: Challenge and Change. Worthington, Ohio: Charles A. Jones Publishing Company, 1972.

8. Hellriegel, Don; Slocum, John W.; and Woodman, Richard W. Organizational Behavior. St. Paul, Minnesota: West Publishing Company, 1986.

9. Knowles, Malcolm. The Adult Learner: A Neglected Species. Houston: Gulf Publishing Company, 1978.

10. Knowles, Malcolm and Associates. Angragogy in Action. San Francisco: Jossey-Ball Publishers, 1984.

11. Military Studies Program Project/Student Cross Reference Report (By Student). Carlisle Barracks: United States Army War College, 4 December 1989.

12. Reference Material, Academic Year 1990. Carlisle Barracks: United States Army War College, August 1989.

13. Schultheiss, Emily E. Optimizing the Organization. Cambridge, Massachusetts: Ballinger Publishing Company, 1988.